Name: Date:

Polynomial Factoring solution (version 626)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 144}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-80}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{8 \pm 4\sqrt{5}\, i}{2}$$

$$x = 4 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 - 3i$ and $7 + 4i$ in standard form $(a + bi)$.**

Solution

$$(6 - 3i) \cdot (7 + 4i)$$

$$42 + 24i - 21i - 12i^2$$

$$42 + 24i - 21i + 12$$

$$42 + 12 + 24i - 21i$$

$$54 + 3i$$

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3. **Write function $f(x) = x^3 - 2x^2 - 19x + 20$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-2	-19	20
-4		-4	24	-20
	1	-6	5	0

$$f(x) = (x + 4)(x^2 - 6x + 5)$$

$$f(x) = (x + 4)(x - 1)(x - 5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 7)^2 \cdot (x + 3)^2 \cdot (x - 2)$$

Sketch a graph of polynomial $y = p(x)$.